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Notice of Allowability	Application No.	Applicant(s)	
	10/065,152	TIEFENTHALER, KURT	
	Examiner	Art Unit	
	Brian J. Sines	1743	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--
All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the response filed 3/11/2004.
2. ☒ The allowed claim(s) is/are 1-52 and 54-75.
3. ☒ The drawings filed on 22 September 2002 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) ☒ All b) ☐ Some* c) ☐ None of the:

1. ☒ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 09/508,384
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---|--|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____ | 7. <input type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |

DETAILED ACTION

Terminal Disclaimer

The terminal disclaimer filed on 3/11/2004 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of U.S. Pat. No. 6,455,004 B1 has been reviewed and is accepted. The terminal disclaimer has been recorded.

Allowable Subject Matter

Claims 1 – 52 and 54 – 75 are allowed.

The following is an examiner's statement of reasons for allowance:

Regarding claim 1, the cited prior art neither teach or fairly suggest an optical sensor comprising of: at least one optical waveguide with a substrate; a waveguiding material; a cover medium; at least one waveguide grating structure; at least two sensing pads comprising of at least one unidiffractive or multidiffractive grating, at least one of the sensing pads comprising either a chemosensitive or biochemosensitive substance, and at least one of the sensing pads comprising either a reference chemosensitive or biochemosensitive substance; a light source means for the illumination of the gratings of the sensing pad and of the reference pad; a detection means for either the detection of the positions or intensities or both of at least two light distribution portions, in which, on the detection means, are not superimposed on one another and which are either emitted or coupled out or both from the waveguide grating structure either into the substrate or into the cover medium, or both; and a means for the generation of a reference sensor signal through the evaluation of the detected light distribution, of the detected positions or of the intensities of the at least two light distribution proportions or of a combination of these.

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Regarding claim 35, the cited prior art neither teach or fairly suggest a sensor chip comprising: at least one optical waveguide having a substrate; a waveguiding film material; at least one waveguide grating structure, wherein the waveguiding structure comprises of at least two sensing pads, wherein each sensing pad comprises either a chemosensitive or biochemosensitive substance; and wherein the waveguiding film material is not plane-parallel to the bottom of the substrate.

Regarding claim 44, the cited prior art neither teach or fairly suggest a sensor chip comprising: at least one optical waveguide with a substrate comprising a bottom portion; a waveguiding film material; and at least one waveguiding structure, wherein the waveguiding structure comprises at least two sensing pads, wherein each pad comprises either a chemosensitive or biochemosensitive substance, and wherein each sensing pad comprises at least one in-coupling grating and at least one out-coupling grating, wherein the in-coupling gratings of the two sensing pads are arranged next to each other.

Regarding claim 54, the cited prior art neither teach or fairly suggest a sensor chip comprising: at least one optical waveguide with a substrate, a waveguiding film material, , at least one waveguide grating structure, wherein the substrate comprises a waveguiding film material and at least one waveguide grating structure, wherein the waveguide grating structure is configured to comprise at least two sensing pads, wherein each sensing pad comprises either a chemosensitive or biochemosensitive substance, wherein each sensing pad further comprises one unidiffractive or multidiffractive grating for use in a reflection-type zero diffraction order or higher diffraction order arrangement or in a transmission-type zero diffraction order or higher

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diffraction order arrangement or in a reflection-type and transmission-type zero order or higher diffraction order arrangement.

Regarding claim 63, the cited prior art neither teach or fairly suggest an optical process for either the characterization or detection, or both, of at least one chemical or biochemical substance in a specimen by means of a waveguide grating structure containing at least one waveguide grating structure unit, wherein the method comprises the steps of:

contacting the specimen with the waveguide structure in at least one contact zone comprising a sensor chemosensitive or biochemosensitive substance and a reference chemosensitive or biochemosensitive substance in the waveguide structure in the region of the at least one contact zone;

exciting at least two light waves through the waveguide grating structure unit or at least one grating of the sensor pad and one grating of the reference pad of the waveguide grating structure unit that are illuminated;

bringing at least one light wave into interaction with the specimen, wherein the light waves differ in at least one of their polarization, their mode number, their wavelength and of their position on the waveguide grating structure, or the sensor chemosensitive or biochemosensitive substance and the reference chemosensitive or biochemosensitive are different, or where at least one light wave is brought into interaction with a first specimen and a second light wave is brought into interaction with a second specimen;

detecting light in at least two differing proportions, which are not superimposed on the detection means and of which at least one proportion originates from the at least one contact zone;

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generating at least one referenced measured signal by the evaluation of the detected light.

Regarding claim 71, the cited prior art neither teach or fairly suggest a sensor chip comprising: at least one optical waveguide having a substrate comprising a bottom, a waveguiding material, and at least one waveguide grating structure, wherein the waveguide grating structure comprises at least two sensing pads, wherein each sensing pad comprises a chemosensitive or biochemosensitive substance, and wherein the sensor chip further comprises a capillary flow cell or an array of capillary flow cells or a capillary vessel or an array of capillary vessels.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian J. Sines whose telephone number is (571) 272-1263. The examiner can normally be reached on Monday - Friday (11:30 AM - 8 PM EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill A. Warden can be reached on (571) 272-1267. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Jill Warden
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Technology Center 1700